cost per mile up big time when 'honest' analyses used. Put Nation's resources to use where it benefits the Nation & all citizens the most. [EPA-HQ-OAR-2010-0799-8041-A1, p. 7]

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2. EPA Draft Regulatory Impact Analysis 'Proposed Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards' EPA-420-D-11-004 November 2011

Organization: Knapp, B.

With our economy remaining is a severe slump, this is no time to increase the cost of a vehicle. [EPA-HQ-OAR-2010-0799-8255-A1, p. 1]

Organization: Lipetzky, P.

This will only lead to higher fuel and vehicle cost and in the end will amount to the same. [EPA-HQ-OAR-2010-0799-8184-A1, p. 1]

Organization: Marshall, C.

Historically, there have been two topics of pushback by those who would oppose this standard. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Regarding increased costs, my hunch is that the greater than $2K in the added cost of new cars is a worst-case analysis. As a contractor for both EPA and OSHA in rulemaking matters, there were reasons that cost estimates for compliance tended to be higher than what happened in reality under a regulation. We couldn't easily take into account control cost savings that were expected because of innovation. I suggest putting further thought into finding methods of affordability for people to pay for the incremental capital costs of vehicles. Perhaps an affordability improvement mechanism could be implemented after the regulatory review is performed in 2021 (or 2019) and might depend on revised costs at that time taking into account improvements in powertrain technologies and advances in carbon and composite materials for replacing steel. [EPA-HQ-OAR-2010-0799-5917-A2, p. 1]

Organization: National Association of Clean Air Agencies (NACAA)

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 41.]

Measures that could lead to greater penetration to vehicles earlier in the programs could bring down vehicle cost.

Organization: National Automobile Dealers Association (NADA)

NADA is also urging NHTSA and EPA to conduct and include in its final rule a worse case cost scenario reflecting a $12,349 average per vehicle cost to comply with the proposed mandate for MY 2025. This suggestion is being made to reflect the fact NHTSA and EPA are engaged in a rulemaking earlier than necessary aimed at applying mandates further out than necessary where many dynamic and hard to forecast variables are involved. These factors include conventional fuel costs, alternate fuel availability and costs, compliance technologies and their costs, interest rates, the general economy, etc. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

If NHTSA and EPA were practiced at setting far-in-the-future standards based on hard to forecast variables, NADA would not be concerned. However, both agencies have historically set new CAFE and emissions mandates consistent with specific statutory time frames and in conformance with the statutory requirements for lead time and duration discussed in detail below. That is, with one major exception. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

In the mid to late 1990s, EPA began the process of setting new tailpipe standards for on-road commercial trucks and engines, culminating in rules issued in 1997, 2000, and 2001 for MYs 2004-2010. Largely due to EPA's failure to accurately forecast compliance technologies and costs far into the future, these rules underestimated compliance costs by some 2-5 times what actually were incurred. In addition to detailing this forecasting failure, the attached look-back paper reviews some of the devastating impacts these truck mandates generally had on the new truck marketplace, and in particular on new truck customers, on truck and engine manufacturers and suppliers, and on dealers. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

In summary, given this recent and devastating example of what can happened when mandates are set too far into the future, the final rule should include a worse case MY 2025 cost scenario of $12,349 per vehicle, which approximates roughly 4.2 times the $2,936 NHTSA cost estimate discussed above. [EPA-HQ-OAR-2010-0799-9575-A1, p. 5]

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, pp. 69-71.]

And, third, the proposal dramatically underestimates cost impacts on new vehicles.

To work, fuel economy rules must require improvements that are affordable. Why? Because you can mandate what the manufacturers must build but you can't dictate what consumers will buy. If our customers do not purchase these products, we all lose.

Not that we're not suggesting the proposal is technologically infeasible. For example, my manufacturer Ford Motor Company has or can develop the engineering and manufacturing expertise necessary to comply, but at what costs. Our concern is for our customers and the prices that they will face.

[These comments were submitted as testimony at the San Francisco, California public hearing on January 24, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11787, pp. 55-56.]

The total cost of the administration's three fuel economy rules is approximately 210 billion. To put this figure into perspective, that's more than twice the amount of total government aid to the auto industry in 2009 and '10. The $157 billion proposal is by far the costliest auto regulation ever, and comes on the heels of the 2010 record-setting $51 billion fuel economy rule. I always have to remember that a billion is a thousand million.

And of course, these new regulatory costs will be borne by customers. And they exclude the billions of dollars in other new regulations you and California regulators have planned. No one in the government seems to be looking at the bigger picture of what all this regulatory activity is doing to the affordability for the average American.

Organization: Natural Resources Defense Council (NRDC)

[These comments were submitted as testimony at the Detroit, Michigan public hearing on January 17, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11786, p. 199.]

Under the rule, the U.S. would invest about $300 billion in new vehicle technologies bringing cleaner, more fuel-efficient cars and trucks to the marketplace.

Organization: Pennsylvania Department of Environmental Protection

The Agencies Should Evaluate Fuel Costs, Availability, and Impacts of Higher Octane Gasoline.

Costs and Life-Cycle Costs. The extra cost for higher octane gasoline should be used to estimate the costs for this rulemaking. It appears that EPA used the cost of regular gasoline in their RIA (p. 3-15) for this rulemaking. Also, the increased performance that EPA is expecting to achieve from turbocharging and other technologies seems to be based on the vehicle using higher octane fuel. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

All potential costs and environmental impacts must be considered such as supply chain burdens, transportation availability, market transition costs, capital investments for higher octane gasoline and/or for production of additional ethanol or alkylates and the possibility of shortages in some areas of the country. [EPA-HQ-OAR-2010-0799-7821-A1, p. 3]

Nevertheless, we are concerned that much of the nation's gasoline supply will require higher octane levels to meet these GHG standards and that EPA has not considered the implications. EPA either needs to address (in the face of manufacturers' current recommendations) why more mid-grade gasoline will not be needed to run turbocharged, high-compression engines or the implications of greater use of higher octane gasoline should be fully evaluated. [EPA-HQ-OAR-2010-0799-7821-A1, p. 5]

Organization: Ross, D.

[These comments were submitted as testimony at the Philadelphia, Pennsylvania public hearing on January 19, 2012. See Docket Number EPA-HQ-OAR-2010-0799-11788, p. 242.]

Anticipated net savings could be much greater if the real price of gasoline rises between now and 2025 as seems all too plausible given rising demand for fossil fuels in low income countries, political and economic unrest in oil-rich regions, and the eventual recognition by the public and political elites of the dire consequences of human-influenced climate change.

Organization: Smith, Frank Houston

State of current ICE technology and Comparative Costs

This clearly demonstrates that the worst case average 'diesel vehicle price premium' is less than $1,800 for European small displacement diesels ... offering a minimum gain in fuel economy of 50% [18 mpg(US)]. [NHTSA-2010-0131-0240-A2, p.2]

For example the new Chevrolet New MY 2012 Aveo 1.3VCDi eco (95PS) (US Sonic?), and Kia 5 door '1 Air' 1.1 CRDi 74bhp ISG Rio are NEDC rated above 78 mpg(Imperial) [≈65 mpg(US)] combined. After excluding value add (VAT) and other EU taxes, both should have list export prices below $15,000 USD including the less than a $1,500 premium for 62% and 40% fuel economy improvements over their respective significantly less fuel frugal gasoline counterparts rated 48 and 56 mpg(Imp) combined, again NEDC. [NHTSA-2010-0131-0240-A2, p.2]

The 1.6 TDCi 95 Edge Econetic Fiesta Titanium offers similar fuel economies for about $18.9k and only roughly $1.3K more than its' 48.7 mpg(Imperial) [≈41 mpg(US)] combined 1.6 Liter gasoline counterpart. The 1.6 L diesel Edge Econetic should export for roughly $16.9K with a possibility of 1.5 gallons/100 miles. [NHTSA-2010-0131-0240-A2, p.3]

In fact there is an 8.5K pound GVW diesel Sprinter 2500 planned for the US in 2013 expected to provide an average 30 mpg(US) in mixed driving… better than the base Sonic. Size/weight may not be the major issues. [NHTSA-2010-0131-0240-A2, p.3]

This leads to the question of which models might already have been (or might be) seen on US highways and what is the best fuel economy they currently offer outside the US results in the following analysis. [NHTSA-2010-0131-0240-A2, p.3] [[See Tables 2 &3 in Docket Number NHTSA-2010-0131-0240-A2, pp.3-4]]

Organization: Tarazevich, Yegor

Introduce gas tax that will gradually grow to $2 per gallon by 2025 to reduce air pollution and oil dependence. Otherwise with high MPG cars will just drive more. With high MPG cars people will still pay less for car ownership than they do today. [NHTSA-2010-0131-0199, p.1]

Organization: Van Voorhies, M.

It is lunacy to think that driving up the cost of cars and trucks is worth the time, effort and cost!! [EPA-HQ-OAR-2010-0799-1629-A1, p. 1]

Organization: Volkswagen Group of America

The 2012-2016 rulemaking will, according to the agencies, cost automakers more than $52 billion – a higher cost than any rulemaking has ever imposed on any regulated industry. Volkswagen continues to make significant investments to both improve our conventional technologies and introduce advanced concepts into the US market. We have crafted a product portfolio that will be attractive to consumers while also achieving compliance with stringent 2012-2016 CO_2 and fuel economy targets. [EPA-HQ-OAR-2010-0799-9569-A1, p. 3]

Cost of compliance for manufacturers weighted more towards light truck sales is projected to be on the order of $1,300-1,600 for 2012-2021. A Wall Street Journal article that appeared online on July 18, 2011 ('White House Offers Auto Makers Concessions to Win Mileage Support') describes how proposals to improve the fuel economy of pickups and sport utility vehicles at a slower pace than passenger cars would 'benefit Detroit manufacturers.' [EPA-HQ-OAR-2010-0799-9569-A1, p. 10]

Response:

Regarding the comments from AFPM that the potential need to restrict recharging times could adversely impact market penetration of electrified vehicles, we do not believe that the market penetrations shown by our analysis (~2% increase in EVs and PHEVs in the 2025MY, see Table III-29 of the preamble) will have sufficient impact on the electrical grid to require any such restrictions to recharging times. As for the AFPM comment that we have not properly analyzed the impacts on carbon emissions that could result from increased electricity demands, this is not correct. We have accounted for increased electricity demands in our analysis as well as the increased carbon and other emissions associated with that increased demand. See preamble section III.F.1 and Table III-64 (showing quantified estimates of upstream electricity and associated GHG emissions attributable to EVs, as there explained, electricity emission factors used in those estimates were derived from EPA's Integrated Planning Model). AFPM also commented that we have made an unrealistic assumption by assuming that the consumer market is sufficient to absorb the expected number of EVs without subsidies. Again, we disagree. We believe that the low penetration rates of EVs and PHEVs shown in our analysis can be made up by early adopters and the kinds of consumers that want such vehicles despite their payback characteristics. Further, we have not suggested that EVs or PHEVs are as cost effective as more traditional technologies; this is why their predicted penetration rate for MY 2025 is quite modest and why they are not projected to be needed at all to meet the MY 2021 standards. What we have shown is that the final standards provide significant public benefit and a path exists toward attaining both the standards and those benefits.

The Defour Group argues that the agencies have deviated from using mainstream economic assumptions to estimate costs in favor of new and unorthodox methodologies. It is not clear what methodologies the commenter considers to be unorthodox. If the meaning is that our use of teardown studies to estimate technology costs was unorthodox, then we disagree strongly. We believe, and nearly all commenters have agreed, that teardown studies represent the best method of estimating technology costs. See Chapter 3.1.1.1 of the joint TSD where we describe the teardown studies conducted for our GHG rules, the peer reviews that have been done and

changes made in response to them. Further, we believe that our technology cost estimates represent the best and most up-to-date estimates available today. The commenter also questions our accounting procedures used to estimate costs. The commenter claims that, if the government's cost estimates are too low, auto makers may find themselves building vehicles that consumers are unwilling to purchase. We believe that recent trends suggest otherwise, such as the unexpectedly high sales of the Ford EcoBoost engine despite its higher cost relative to lower fuel economy engine choices for the same vehicle model. Further, at least thirteen automakers have expressed strong support for the proposed standards. We do not believe that they would have done so if they believed the standards compelled production of unsalable vehicles. See also the detailed responses to the Walter and Drake study and critique in section 18.1 above.

Regarding comments from Growth Energy, we have based on EV/PHEV cost estimates on the ANL BatPaC model (battery pack costs) and on FEV teardown studies (electric motors, etc.). We believe that the costs we are using are the best available cost estimates for EV/PHEV technology available. We have also used our High 1 and High 2 markups to estimate indirect costs, and have applied learning effects that are in line with the literature. We disagree with Growth Energy when they claim that we have not estimated costs reliably. Importantly, the information upon which Growth Energy appears to have based this claim is the NAS 2011 report. In that report, NAS states the following about their report, "The cost estimates represent estimates for the current (2009/2010) time period to about 5 years in the future." (See "Assessment of Fuel Economy Technologies for Light-Duty Vehicles," National Academy of Sciences 2011, Summary at page 1.) Therefore, the NAS costs are not applicable for the MYs 2017-2025 rulemaking timeframe. We have discussion of this in RIA Chapter 3.11.7 Further, our final analysis does not project a significant penetration of EV/PHEV technology so the impacts on our program costs are not significant. Lastly, we conducted a sensitivity surrounding our battery-pack costs and our indirect cost markups (which would also impact battery-pack costs) and neither sensitivity suggests significant impacts on the program.

Regarding the comment from Mr. Haroldson, we disagree that vehicles will become too expensive to purchase, especially in light of the significant savings that owners will realize on lower fuel expenditures. Our analysis shows that the cumulative fuel savings will exceed cumulative costs in just over 3 years, well within the typical vehicle ownership period, and that consumers purchasing new vehicles with credit will see immediate reductions in monthly payment amount. See preamble tables III-84 and III-85 and accompanying text. As for safety, we also disagree that vehicles will become too small to be safe to drive. In fact, our analysis was done assuming that vehicles would not change size at all (footprint will not change and, thus, passenger volume will not change). As explained in preamble section II.C and II.G, the footprint attribute removes inherent incentives to downsize as a compliance strategy (downsizing just makes the fleet average more stringent), and the agencies have developed safety neutral compliance paths limiting use of mass reduction as a compliance pathway for lower weight vehicles. Indeed, there were pointed comments (e.g. from CBD and ACEEE) that the proposed standards created incentives to upsize the fleet. Although we disagree with those comments, they stand in stark contrast to the assertions made here. Lastly, while reducing our dependence on foreign oil is a significant benefit of our standards, the primary intent is to reduce GHG emissions. That cannot be done by simply replacing consumption of foreign oil with consumption of domestic oil without a corresponding reduction in oil consumption and related vehicular GHG emissions.

Regarding comments from ICCT, we have not included a sensitivity using the 2011 NAS costs. We agree with the commenter that the costs contained in the 2011 NAS report were meant for the more immediate timeframe and are not necessarily appropriate for use in the 2017-2025 timeframe.

Regarding the comments from Mr. Jackson, the primary point of the comments appears to be that EPA has conducted a faulty analysis in support of the proposal. Mr. Jackson also appears to be concerned that we have assumed certain technology penetration rates to ensure that our rule has the appearance of being beneficial while, if different penetration rates were to occur, our rule would have different costs and benefits. This is incorrect. EPA's OMEGA modeling, the source of the technology penetration rate projections, is entirely transparent and refutes this unfounded comment in all respects. See, e.g. RIA sections 3.1to3.11. Thus, we have not prejudged the technology penetration outcome nor have we forced certain technologies into the mix with the intent of forcing them on the American car buyer. Instead, we have demonstrated what we believe to be the most cost effective approach for each individual auto maker to reach compliance with the final standards given the makeup of that particular manufacturer's fleet. EPA's technology penetrations projections are not binding in any way on the manufacturers, and manufacturers are free to choose any technology pathway for the fleets so long as they are meeting their CO2 target compliance levels. The possible technology outcomes are the result of the standard in conjunction with the footprint basis of the standard and, of course, the technologies available to reach the standards. The outcomes are not predetermined by EPA. Therefore, it is true that a different fleet mix might result in different program costs and benefits, but the fleet mix that will exists in the 2025MY will be driven by the auto makers and the vehicle buying public within the constraints of the standards, not by EPA. Mr. Jackson is also concerned about the multiplier credit available to EVs as a means of encouraging the development of EV technology, which is addressed in Section 4 of this document as well as in preamble section III.C.2.

Regarding comments from Mr. Knapp and Mr. Lipetzky, we disagree that the final rule will result in higher fuel costs—why would fuel costs rise when so much less gasoline will be used—and we disagree with the implication that our rule will be harmful to our slumping economy. In fact, our analysis suggests that the final rule will not only provide significant public benefit, but it may also increase sales and jobs (see preamble sections III.H.11 and 12 and Chapter 8 of the final RIA).

Regarding the comment from Mr. Marshall, we agree that regulatory cost estimates probably overstate reality in general. However, this is a very difficult thing to prove or even analyze. That said, we have attempted to estimate the impacts of learning by doing in making our cost estimates (see preamble section II.D.2.d and Chapter 3.1.3 of the joint TSD). While not overly aggressive in that attempt, we believe that our learning effects strike the proper balance between being conservative and respectful of auto maker and supplier ingenuity.

Regarding the comment from the NACAA, we assume that the claim that, if vehicles equipped with the technologies needed to meet the MY 2025 emissions were introduced earlier then the additional cost per vehicle should be lower than $2000, is a reference to learning effects starting earlier and resulting in lower costs by 2025. While that may be true, one cannot lose sight of the need to introduce new technologies at a sustainable and reasonable pace. We have

attempted to provide auto makers sufficient time to introduce new technologies on a pace that will not result in scrapping of new model introductions or requiring model introduction outside of the existing model redesign schedules (thus serving to reduce costs[67]) and on a pace that will not result in costly mistakes and technology failures. in addition, a more rapid phase-in of the standards than we have provided for may well reduce some technology costs by 2025 (due to a longer learning period) but may also increase warranty costs and stranded capital costs, etc..

Regarding the comments from NADA, we have conducted a separate analysis of NADA's (incorrect) claims about the impacts of our heavy-duty highway 2007-2010 rulemaking on the industry. That analysis, given its length and detail, is presented in its entirety at the end of this response section 18.2 as a supplemental response to NADA Exhibit B.. In short, we disagree with NADA's claims and NADA's assertions that we should apply a 4.2x factor to our cost estimates to shed light on the "worse case" (*sic*) scenario. NADA also claims that the rule will result in cars that consumers do not want to buy and, if so, we all lose. We agree that we all lose in that scenario, but disagree that the scenario will play out. In fact, we believe that, for the most part, 2025MY vehicles will look and feel much the same as today's vehicles. There is no reason to believe that the highly boosted and downsized engines upon which the final rule overwhelmingly relies will be unattractive to consumers. In fact, Ford is selling considerably more of its turbocharged and downsized engine equipped F150 pickups than they expected and fewer of the F150s equipped with more traditional V8 naturally aspirated engines. And this is true in a market segment – large pickup trucks – that has traditionally been the one of the least concerned with fuel economy and the most reluctant to accept smaller engines.

NADA also expressed concerns about the high costs of the Administration's three fuel economy/greenhouse gas emission rules. These rules certainly have costs, which the agencies have estimated carefully, but the rules also provide unparalleled savings to consumers and benefits to society that far outweigh the expected costs. We discuss NADA's inappropriate accounting of costs for the rules in section 18.2.1, below. Moreover, these rules have been actively supported by the auto manufacturing industry. EPA strongly doubts that the industry would offer this strong support if manufacturers' believed that the increased costs of installing new technology was either unaffordable or led to unmarketable vehicles.

Regarding comments from the Pennsylvania Department of Environmental Protection, we do not agree that higher octane fuel will be necessary for high compression turbocharged and downsized engines to prevent the onset of combustion knock. EPA assumed no change in the octane of certification or in-use gasoline within its analysis and the effectiveness values used for the high BMEP engines reflect that fact. The current Ford EcoBoost turbocharged GDI engines do not require the use of premium fuel, although those engines are not operating at BMEP levels as high as those expected under our rule. Importantly, a combination of both intake charge dilution (e.g., cooled EGR) and in-cylinder evaporative fuel cooling (e.g., direct injection) are expected to allow higher BMEP GDI engines to operate on regular grade gasoline. All packages

[67] See 75 FR at 25451 describing increased costs associated with introduction of major vehicle changes outside the normal redesign cycle ("[t]he amortized cost of the capital necessary to produce a new vehicle design will increase by 23%, from one-fifth of the capital cost to one-fourth …This would be on top of the cost of the emission control equipment itself. …The capital costs associated with vehicle redesign go beyond CO2 emission control and potentially involve every aspect of the vehicle and can represent thousands of dollars").

at 27 bar BMEP analyzed by EPA included cooled EGR to allow higher BMEP operation and prevent the onset of combustion knock on current certification or in-use fuels. See Joint TSD p. 3-88 ("Use of GDI systems with turbocharged engines and air-to-air charge air cooling also reduces the fuel octane requirements for knock limited combustion and allows the use of higher compression ratios.")

Regarding the comment from D. Ross, we agree that fuel savings will be greater should future fuel prices be higher than projected in the AEO 2012 early release. However, we believe that the AEO projections are the best available projections and that they represent the best projected fuel prices for use in our analysis.

Regarding the comment from Frank Houston Smith, the primary point of the comment appears to be that small engine displacement diesel vehicles like those popular in Europe and other countries provide a possible bridge technology to a future fleet with much lower CO2 emission characteristics. EPA has no preference for the technologies chosen by auto makers, our only requirement is that the standards be met. While it is true that some technologies are receiving credits in the final rule, those credits are meant to incentivize newer and/or emerging technologies. Also, Mr. Smith suggests that it might be necessary to relax the NOx standard such that small engine displacement diesels could more easily meet criteria emissions standards in the US (NOx standards are generally lower for diesels in other parts of the world). This is an idea that EPA opposes for reasons discussed at length in our Tier 2 Highway rulemaking where we took a fuel neutral approach to setting criteria emission standards (see 65 FR 6698 at page 6728, February 10, 2000).

Yegor Tarazevich suggested that EPA introduce a gas tax that would grow to $2 per gallon by 2025 as a means of reducing air pollution and oil dependence. Such an approach is outside EPA's regulatory authority and outside of the scope of this rulemaking.

Michelle Van Voorhies believes that it is lunacy to think that driving up the cost of cars and trucks is worth the time, effort and cost. There are no other details to suggest why Ms. Van Voorhies believes this. We disagree with this comment, since our Benefit Cost Analysis provides considerable detail to support our belief that the new standards will results in significant public benefits and significant savings of fuel resulting in significant reductions of GHG emissions despite the expected increase in new vehicle costs.

In their comment, the Volkswagen Group of America suggests that the costs of compliance for makers of pickups and SUVs is lower than the costs for auto makers whose fleets consist of only cars. Further, the commenter appears to suggest that the standards are structured to benefit the domestic auto makers over other auto makers. Neither comment is true. In fact, each auto maker has a unique standard based on the makeup of its fleet. Likewise, each auto maker has a unique starting point, or baseline or reference point, from which it is starting based, again, on the makeup of its fleet. Another critical factor is the power-to-weight ratio of the vehicles in each manufacturer's fleet, so a vehicle with a footprint of 50 square feet and a high power-to-weight ratio may experience higher costs of compliance than another 50 square foot footprint vehicle with a low power-to-weight ratio. Such is the nature of the footprint based standard. (Many of the manufacturers of these vehicles also chose to pay fines, rather than comply with earlier year CAFE standards. As a result, they have further catching up to do, and

hence higher costs.) The point is that the costs for full line manufacturers (i.e., makers of cars and pickups and SUVs) may be lower than for makers of cars only as a result of power-to-weight ratio characteristics more than fleet makeup. A good example of this would be Hyundai and Kia, who have fleet makeups similar to Volkswagen (mostly cars, some SUVs and cross-over utility vehicles/vans, no pickups), but costs of compliance in line with the full line auto makers.

Supplemental response to NADA Exhibit B, "A Look Back at EPA's Cost and Other Impact Projections for MY 2004-2010 Heavy-Duty Truck Emissions Standards", attached to the comments of the National Automobile Dealers Association (on the EPA/NHTSA proposal, "2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards," EPA-HQ-OAR-2010-0799-9575).

In general, and as discussed in detail below, EPA believes NADA's statements included in Exhibit B to its public comments related to the costs of past heavy-duty criteria emission standards are irrelevant to the Light-Duty Vehicle GHG standards and are incorrect in any case.

Heavy-Duty Vehicle Focus in NADA's Exhibit B

Exhibit B in NADA's comments focuses on Class 4 through 8 heavy-duty trucks. In the exhibit, NADA does not describe the relationship between these heavy-duty vehicles and the light-duty market, which consists primarily of passenger vehicles, or how concerns in one market are relevant to the other market. Further, NADA ignores the Class 2b-3 segment of vehicles which share a stronger resemblance to light-duty vehicles in terms of vehicle types, fuels used to power the vehicles, purchasers, uses, and manufacturers.

There are significant differences between the light-duty and the Class 4-8 heavy-duty vehicle markets. Light-duty vehicles include passenger cars, crossover vehicles, sport utility vehicles (SUVs), minivans, and light pickup trucks. On the other hand, the vehicles that NADA discusses in its comments include vehicles such as tractor-trailers, delivery trucks, cement haulers, utility trucks, street sweepers, and urban buses. There is also a significant difference in the engines used in light-duty vehicles when compared to heavy-duty vehicles. Light-duty vehicles are dominated by the use of gasoline engines, while heavy-duty market contains a mix of gasoline and diesel engines but heavy-duty vehicles are predominately diesel powered. The purchasers also differ. Consumers typically purchase light-duty vehicles for their own personal transportation. In contrast, heavy-duty vehicles are most often purchased by commercial fleets and municipalities for the purpose of moving freight or conducting vocational activities, such as street sweepers.

In Exhibit B, NADA ignores the segment of light heavy-duty vehicles which is dominated by the Class 2b-3 pickup trucks. These Class 2b-3 pickup trucks closely resemble their light-duty pickup truck counterparts and are more relevant to any light-duty vehicle discussion. All three of the major U.S. manufacturers offer a light-duty truck, which are often referred to as "half ton" trucks and are sold as the Ford F150, Ram 1500, and GM Silverado/Sierra 1500. The same manufacturers also offer "three-quarter ton" and "one ton" versions of these pickup trucks sold as the Ford F250/350, Ram 2500/3500, and GM

Silverado/Sierra 2500/3500 trucks. The Class 2b-3 trucks are considered heavy-duty vehicles because their gross vehicle weight rating is over 8,500 pounds. The light and heavy pickup trucks share a number of vehicle characteristics, including some common components and, to some extent, the typical vehicle use. See 76 FR at 57160-61 (Sept. 15, 2011).

Table 1 includes a summary of the vehicle characteristics of the light-duty vehicles covered under the MYs 2017-2025 Light-Duty Vehicle GHG rule, the heavy-duty vehicles discussed in NADA's Exhibit B, and the heavy-duty pickup trucks and vans which were not discussed by NADA in Exhibit B.

Table 2: Light-Duty and Heavy-Duty Vehicle Characteristics

	Light-Duty Vehicles Covered by LD Vehicle GHG Rule	Heavy-Duty Vehicles Discussed in NADA Exhibit B	Heavy-Duty Vehicles Not Included in NADA's Exhibit B Discussion
Vehicle Architectures	Passenger cars, SUVs, crossover vehicles, minivans, light pickup trucks (like Ford F150)	Tractor-trailers, delivery vehicles, construction vehicles, utility trucks, buses, and many others	Heavy-duty pickup trucks and vans (like the Ford F250)
Fuel Use	Significant majority are gasoline powered vehicles	Majority are diesel powered vehicles	Split between gasoline and diesel powered vehicles
Typical Purchaser	Individual consumer	Commercial fleets, municipalities, utility companies, and single truck owners	Mix of individual consumers and small businesses (such as landscape companies)
Vehicle Purposes	Personal transportation. Hauling and towing primarily limited to light trucks and vans.	Delivery of freight or other goods, transportation of people, transportation to worksite, worksite power	Mix of personal transportation and hauling/towing.
Major Vehicle Manufacturers	Chrysler, Ford, General Motors, BMW, Mercedes, Toyota, Honda, Kia, Nissan, and many others	Daimler Trucks, PACCAR, Navistar, Volvo, Hino, Ford, and others	Chrysler, Ford, General Motors, Isuzu, Daimler, Nissan, and others

NADA's Market Disruption Claim

NADA claims that "Implementation of EPA's MY 2004-2010 emission mandates directly resulted in higher truck prices, increased operating costs, reduced reliability, and lower fuel economy performance, which caused dramatic disruptions to the new truck marketplace." (Exhibit B, page 3) NADA's exhibit goes on to state that "Many informed prospective new truck purchasers rushed to 'pre-buy' trucks with pre-compliant technologies to avoid the effects of EPA's mandates." (Exhibit B, page 3) NADA uses the heavy-duty exhibit as support for its (strident) assertion that setting standards "further out than necessary" may have "devastating

impacts" on the marketplace (NADA comments, Docket EPA-HQ-OAR-2010-0799-9575, page 5). EPA believes that NADA's heavy-duty market disruption claims are not relevant to the Light-Duty Vehicle GHG proposal because of the differences in vehicle types, usage, and markets as discussed above. NADA did not make any claim of pre-buy relative to the heavy-duty pickup trucks and vans (the most analogous heavy-duty vehicle segment, as just explained), and EPA did not find any evidence to support pre-buys in that vehicle segment. Further, EPA discusses three additional reasons why any heavy-duty market disruption claim is irrelevant to the MYs 2012-2017 light-duty vehicle rulemaking.

First, there is a significant difference in the regulatory structure between the heavy-duty standards for criteria pollutants and the light-duty vehicle GHG standards. NADA's pre-buy argument is not applicable to the light-duty vehicle GHG program because of this difference in structure. Under the Clean Air Act Section 202(a)(3)(C), the heavy-duty criteria emission standards are required to apply for a period of no less than three model years, which is commonly referred to as the stability requirement.[68] As NADA points out in Exhibit B, EPA promulgated new heavy-duty criteria pollutant emission standards in 2004 and 2007, with the 2007 standards phased in through 2010. However, unlike heavy-duty vehicle and engine emission standards, the Clean Air Act does not require a minimum stability period for light-duty vehicle emission standards. NHTSA and EPA have structured the light-duty vehicle fuel economy and GHG final standards such that they require *annual* improvements for MYs 2017 to 2025. This builds on the MYs 2012-2016 light-duty vehicle GHG and fuel economy standards. The annual increase in CAFE standards for light-duty trucks actually began for MY 2005 and the annual increase for passenger cars for MY 2011.[69] In addition, the light-duty vehicle GHG standards are a fleet average standard where each manufacturer may select a different standard and compliance path unique to its fleet. For example, some vehicles may see changes in one model year, while others will remain constant. As such, the light-duty vehicle market is not expected to experience a significant change in the vehicles available for sale in any given year. NADA's claim that pre-buys disrupt markets is therefore not relevant to the light-duty vehicle GHG standards because the light-duty program requires modest, annual incremental increases in the stringency and costs of emission standards which are unlikely to have a substantial effect on purchasing behavior.

Second, it is not appropriate to apply NADA's claim of "pre-buy" in the heavy-duty market, in response to the costs of heavy-duty criteria pollutant emission rules, to the light-duty vehicle GHG standards because of the significant financial benefit to consumers accruing from the GHG rules. As documented in the proposal and final rule, the standards will result in a significant improvement in fuel economy and therefore reduce operating costs. Though the standards increase the upfront costs of the vehicles, owners will experience lower operating costs due to the improved fuel economy and reduced GHG emissions. In fact, in the MYs 2012-2016 light-duty vehicle GHG rule, EPA projected an increase in vehicle sales in the 2012 through 2016 timeframe if consumers take into consideration at least five years' worth of fuel savings

[68] United States Code, Title 42, Chapter 85. May be accessed at http://epa.gov/oar/caa/title2.html

[69] U.S. National Highway Traffic Safety Administration. May be accessed at http://www.nhtsa.gov/fuel-economy.

when considering whether to buy a new vehicle.[70] Similarly, as highlighted in the proposal, a light-duty vehicle consumer who purchases a vehicle in the 2017 through 2025 timeframe would not have any financial incentive to avoid the purchase because the average consumer would see a payback in the upfront costs in less than four years and on average gain a net savings of $3,000 to $4,400 over the lifetime of the vehicle based on the proposed standards (discount rates of both seven and three percent, respectively).[71] Consumers purchasing vehicles on credit would see immediate savings because monthly fuel savings more than offset the increase in monthly loan payment amount. Preamble section I.C.

Third, finalizing light-duty vehicle standards for the MYs 2017-2025 timeframe now provides regulatory certainty to auto manufacturers and suppliers along with the opportunity for long-term planning and time for continued development and deployment of GHG emission reducing technologies across the light-duty vehicle fleet. By setting standards with a significant amount of lead time, EPA is addressing one of the concerns raised by a General Accounting Office (GAO) study related to the 2007 heavy-duty standards.[72] GAO suggested that EPA should address concerns raised by purchasers about whether new engines will be ready in time for validation testing by the vehicle manufacturers and truck fleets to help prevent any potential pre-buy of older engines before 2007. Longer lead times, such as those provided in the 2017-2025 light-duty vehicle GHG program, could help consumers be more confident in the performance and durability of these new technologies because it provides the time for auto manufacturers and suppliers to develop and implement technologies in a robust manner and with sufficient time to ensure durability and reliability targets are met.

Finally, NADA's assertions that the 2004 and 2007/2010 heavy-duty emission standards caused the heavy-duty truck sales fluctuations over the past decade are mistaken. EPA believes that there are many factors that impact truck sales in any given year. For example, the American Trucking Associations develops the U.S. Freight Transportation Forecast based on factors such as the change in the U.S. gross domestic product, consumer confidence, housing, capital equipment purchases, government spending, imports and exports, bond yields, and truck capacity utilization.[73] Figure 1 below shows the annual sales of heavy-duty trucks (those with a gross vehicle weight rating of over 14,000 pounds) and the annual rate of change of the U.S. Gross Domestic Product (GDP) since 2000. Although the figure is not intended to imply causality, because other factors are expected to influence vehicle sales, it does provide an indication that factors such as the annual growth rate of the U.S. GDP may have an impact on truck sales.[74]

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[70] U.S. Environmental Protection Agency and National Highway Traffic Safety Administration. 75 Federal Register, May 7, 2010. Pages 25517-25518.

[71] U.S. Environmental Protection Agency and National Highway Traffic Safety Administration. 76 Federal Register, December 1, 2011. Pages 74972-74973. See also section I.C to preamble to final rules.

[72] U.S. General Accounting Office. "EPA Could Maximize the Benefits from the 2007 Diesel Emissions Standards by Better Addressing Industry Concerns." Appendix III – Comments from the Environmental Protection Agency. May be accessed at http://www.gpo.gov/fdsys/pkg/GAOREPORTS-GAO-04-313/html/GAOREPORTS-GAO-04-313.htm

[73] American Trucking Associations, Inc. U.S. Freight Transportation Forecast to 2022. Pages 10-12 and 52-53. 2011.

[74] The correlation between the truck sales and the annual GDP percent change was +0.78.

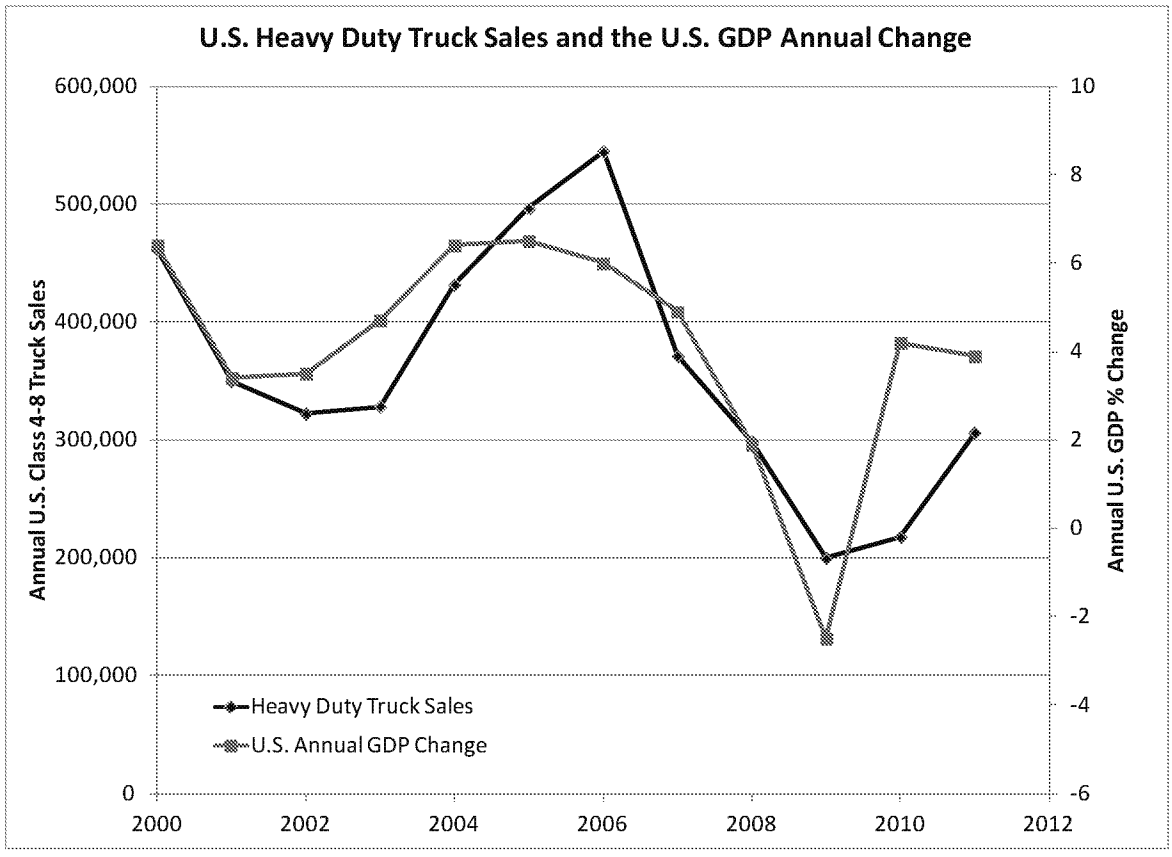

Figure 1: U.S. Class 4-8 Truck Sales and U.S. GDP Annual Growth Rate[75]

Projected Cost of Compliance

NADA's Exhibit B also discusses EPA's projected fixed and operating costs of medium and heavy heavy-duty engines related to the 2004 and 2007/2010 criteria pollutant emission standards. NADA claims that by setting standards seven to ten years before implementation, EPA "dramatically underestimated" the costs associated with the program (Exhibit B, page 3). NADA makes no attempt to comment on the specific details of EPA's detailed cost analysis for the proposed MYs 2017-2025 light duty vehicle standards (with the exception of indirect costs which we address in responding to NADA's Exhibit A) and NADA's discussion is focused on costs that are not related to the light-duty vehicle GHG standards. We nonetheless explain why NADA is incorrect as to that other rule.

As stated in the 2007/2010 heavy-duty emissions rule, EPA developed the compliance costs of the NOx standard assuming that NOx adsorbers would be the most likely technology

[75] U.S. Truck Sales represent Class 4-8 truck sales from Ward's Auto Group's "U.S. Truck Sales by GVW by Month" 2000 through 2011. U.S. Gross Domestic Product percent change based on current dollars from the Bureau of Economic Analysis. Last accessed on May 8, 2012 at http://www.bea.gov/national/index.htm#gdp

applied by industry in order to meet the NOx standards.[76] As noted in the 2007/2010 HD rule, we recognized that manufacturers had several years before implementation of the standards and we expected research would lead to enhanced emission control technologies with focused research efforts on drawbacks, such as fuel economy impacts, in an effort to minimize any potential negative effects.[77] As a result of the industry's research and development efforts, most heavy-duty engine manufacturers selected a technology path that included selective catalytic reduction (SCR) for 2010 NOx compliance rather than NOx adsorbers. There are several reasons why manufacturers selected this technology for the market. For one thing, manufacturers introduced SCR into the European heavy-duty market in the 2006 timeframe to meet the Euro V emission standards.[78] The earlier introduction of the technology in Europe provided engine manufacturers time to gain experience with the technology in the marketplace before it was implemented in the United States. The use of SCR in the U.S. also provides global engine manufacturers with ability to use the research and development experience that they gained in Europe in addition to the potential economies of scale to reduce costs. SCR also provides the manufacturers with the flexibility to balance engine-out NOx emissions and fuel consumption to meet market demands. We believe, and manufacturers have provided confidential business information to support, that manufacturers have the ability to raise the engine-out NOx emissions of 2010 engines equipped with SCR to levels above the 2004 NOx levels in an effort to improve fuel consumption while remaining in compliance with NOx emission standards.

We would expect the cost analysis conducted by NADA to show that the compliance costs and manufacturer surcharges with respect to the 2007/2010 rule are different for two reasons. First, EPA developed costs in the 2007/2010 rule for a different emission reducing technology than the technology that was actually used in the market. Second, NADA used manufacturer surcharges in the comparison. Manufacturer surcharges are not equivalent to compliance costs. As would be expected, surcharges are often greater than the compliance cost because they are set by the manufacturers based upon what they believe the market will bear. This premise is supported by confidential business information submitted to EPA for the Heavy-Duty Engine Nonconformance Penalty proposal.[79]

EPA attempted to conduct a retrospective analysis of our projected costs of the heavy-duty gasoline engine emission standards. However, we were unable to develop a robust method to identify the gasoline engine price (or cost) increases that were solely related to emissions which were passed along to consumers in the heavy-duty pickup market.

However, EPA has conducted a simple analysis of the projected costs of the 2004 and 2007/2010 light heavy-duty diesel engine standards relative to the price increases that one major manufacturer actually placed on their heavy-duty diesel pickup trucks. As noted above, these pickup trucks are more similar to the half-ton pickup trucks included in the light-duty vehicle segment than are the heavier trucks referred to by NADA. EPA is utilizing manufacturer

[76] 66 FR at 5090, January 18, 2001

[77] 66 FR at 5090, January 18, 2001

[78] Cummins. Diesel Exhaust Fluid (DEF) Q &A. Last accessed on June 19, 2012 at http://www.cumminsfiltration.com/pdfs/product_lit/americas_brochures/MB10033.pdf

[79] 77 FR at 4736, January 31, 2012.

surcharges in this analysis as a proxy for cost, similar to the approach taken in the NADA analysis, though we have no reason to believe that these particular surcharges were equal to costs associated with emissions abatement equipment.[80] In the analysis below, EPA compares the cost increase that we projected in the 2004 rule, adjusted to 2004 dollars, to the price difference of the diesel engine option on a Ram 2500 pickup truck between 2003 and 2004. As shown in Table 2, the cost increase projected by EPA for the 2004 standard was $541 and Chrysler increased the price of the diesel engine option on the Ram 2500 by $330. By this comparison, EPA's projected cost increase of the 2004 emission standards was $211 greater than the manufacturer's actual price increase.

Table 3: EPA Cost Estimate and Manufacturer Price Increase for 2004 Light Heavy-Duty Diesel Engine Standard (all values in 2004$)

Manufacturer Price Increase[A,B]	$330
EPA Cost Estimate[C]	$541
Manufacturer Price – EPA Cost	**-$211**

Notes:
[A] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options. 2003 Surcharge was $5,225. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2003/standard-equipment/
[B] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options. 2004 Surcharge was $5,555 (2004$). Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2004/standard-equipment/
[C] 2004 Light Heavy-Duty Emission Standard Cost was $485 (1999$). See 65 FR October 6, 2000 at 59936.

Next, EPA compared the cost increase projected in the 2007 heavy-duty rule, adjusted to 2007 dollars, to the price difference of the diesel engine option on a Ram 2500 pickup truck between 2006 and 2007. As shown below in Table 3, EPA's projected cost increase for the 2007 standard was $2,429 and Chrysler increased the price of the diesel engine option on the Ram 2500 by $545. EPA's projected cost increase of the 2007 emission standard was $1,884 more than the price increase of the diesel engine option for this category of engines.

[80] The Agency believes that the heavy-duty engine industry may not be a perfectly competitive market due to the limited number of manufacturers. In a concentrated market like this, pricing strategies such as surcharges may include additional costs for non-regulatory imposed features, non-emission-related regulatory imposed features or additional profit margin.

Table 4: EPA Cost Estimate and Manufacturer Price Increase for 2007 Light Heavy-Duty Diesel Engine Standard (all values in 2007$)

Manufacturer Price Increase[A,B]	$545
EPA Cost Estimate[C]	$2,429
Manufacturer Price – EPA Cost	**-$1,884**

Notes:
[A] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $5,555 in 2006. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2006/standard-equipment/
[B] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $6,100 in 2007. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2007/standard-equipment/
[C] 2007 Emission Standard Cost was $1,986 (1999$). Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (EPA 420-R-00-026), page V-38. Last accessed on May 7, 2011 at http://www.epa.gov/otaq/highway-diesel/regs/ria-v.pdf

Finally, we compare the cost increase projected in 2010 for the 2007/2010 heavy-duty rule, adjusted to 2010 dollars, to the price difference of the diesel engine option on a Ram 2500 pickup truck between 2009 and 2010. As shown below in Table 4, the projected cost increase for the 2010 standard was $2,046 and Chrysler increased the price of the diesel engine option on the Ram 2500 by $2,060 in 2010. In this instance, the projected the cost increase of the 2010 emission standards was $14 less than the manufacturer's price increase for this category of engines.

Table 5: EPA Cost Estimate and Manufacturer Price Increase for 2010 Light Heavy-Duty Diesel Engine Standard (all values in 2010$)

Manufacturer Price Increase[A,B]	$2,060
EPA Cost Estimate[C]	$2,046
Manufacturer Price – EPA Cost	**$14**

Notes:
[A] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $6,100 in 2009. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2009/standard-equipment/
[B] Manufacturer Surcharge for Diesel Engines from Pickup Trucks.com Standard Equipment and Options was $7,615 in 2010. Last accessed on May 7, 2012 at http://www.pickuptrucks.com/dodge/ram-2500/2010/standard-equipment/
[C] 2010 Emission Standard Cost was $1,601 (1999$). Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (EPA 420-R-00-026), page V-38. Last accessed on May 7, 2011 at http://www.epa.gov/otaq/highway-diesel/regs/ria-v.pdf

In summary, the most relevant heavy-duty engine cost discussion for the light-duty vehicle GHG standards did not show that EPA underpredicted costs by "two to five times the actual costs" as incorrectly claimed by NADA (Exhibit B, page 11).

Conclusion

In conclusion, NADA commented on the 2017-2025 Light-Duty Vehicle GHG proposal by submitting a review of the costs of EPA's 2004-2010 heavy-duty standards and a discussion on other impacts on heavy-duty vehicles. Two of the premises of the NADA exhibit were that rulemakings which provide seven to ten years of lead time lead to misrepresented costs and result in market disruptions. This memo discusses why EPA believes that any heavy-duty market disruption claim is irrelevant for the Light-Duty Vehicle GHG program because the regulatory structures of the programs are different and because the GHG program reduces operator costs, unlike a criteria pollutant emission program. NADA fails to discuss any of the market differences between passenger cars and commercial heavy-duty vehicles. In addition, NADA ignores the most relevant segment of the heavy-duty market, the large pickup trucks, for comparison to light-duty vehicles. EPA has examined the actual price increase for the heavy-duty pickup trucks and found they were generally less than the EPA cost estimates, not greater as NADA mistakenly asserts. In addition, we found no evidence of market disruptions for these vehicles during the implementation of the 2004 or 2007/2010 emission standards.

18.2.1. Per Vehicle Average Costs

Organizations Included in this Section

American Petroleum Institute (API)
BMW of North America, LLC
Consumer Federation of America (CFA)
Cuenca, M.
Jackson, F.W.
National Association of Clean Air Agencies (NACAA)
National Automobile Dealers Association (NADA)
Ross, D.
Steyn, R.

Organization: American Petroleum Institute (API)

The market place will determine the need for premium (higher octane) fuel

The EPA and NHTSA note that their assessment of the cost of technologies adopted to comply with the proposed CAFE and GHG standards was not predicated on the need for premium gasoline, and they request comment on this assumption. API concurs with the approach used by EPA and NHTSA in this regard. The market place will address and determine the octane needs of motor vehicles – as it has done, successfully, for decades. There is no need for government agencies to adopt a regulatory approach that pre-determines, prescribes, or specifies vehicle octane requirements. [EPA-HQ-OAR-2010-0799-9469-A1, p. 11]

Octane needs are already addressed by the market and do not require government intervention
The market place will address octane needs of vehicles as it has done successfully for decades.